

A Review of July 2012

The warm year of 2012 continued into July. While it was not a record warm month at most locations, it was the warmest average temperature since 1936 or 1974 at most areas across southeast South Dakota and northwest Iowa. July 1936 is considered the warmest month on record for much of the area. Below is an examination of temperatures from 7 locations across the area – Huron, Sioux Falls, Brookings, Pickstown, Yankton and Academy in South Dakota, and Sioux City, Iowa. For reference to records, here is a table showing how long each site has been recording temperatures and precipitation.

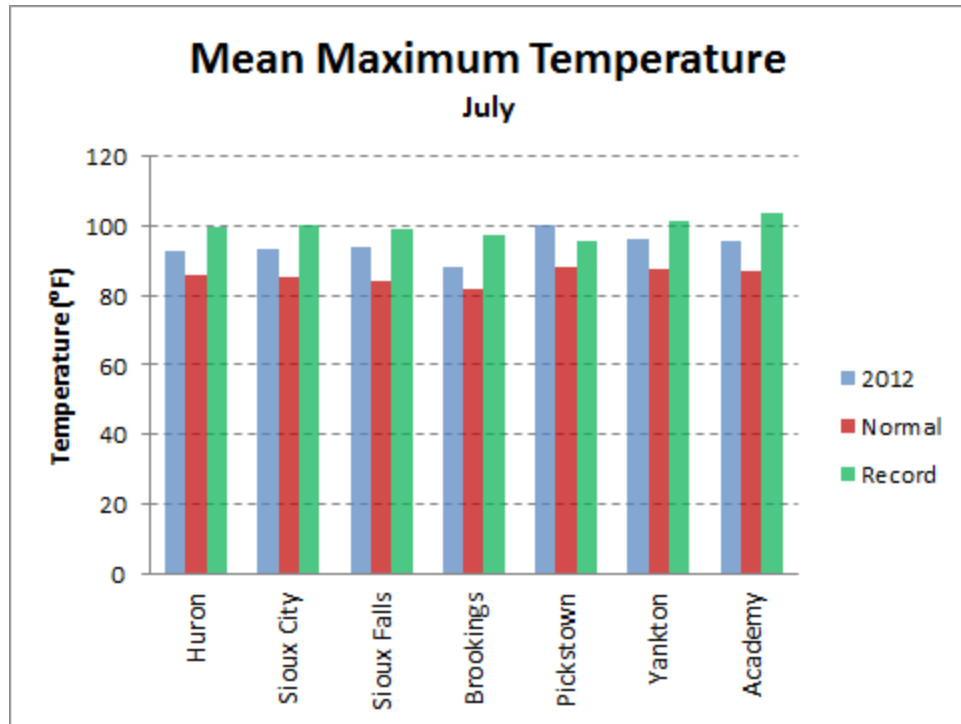
Location	Period of Record
Huron	1882-present
Sioux City	1890-present
Sioux Falls	1893-present
Brookings	1893-present
Pickstown	1948-present
Yankton	1932-1983,1985-present
Academy	1899-present

Notice that Pickstown and Yankton do not include data from all of the 1930s which is considered the warmest decade since records began in the late 19th century.

Maximum Temperature

Except for Brookings, the maximum temperatures averaged over 90 degrees in July. This was 6 to 12 degrees above the normal high for July. Despite being so warm, these temperatures were more than 5 degrees cooler than the record year of 1936. However, except for Huron and Academy, the last years that were so warm belong to other infamous drought years in southeast South Dakota – 1936, 1957 and 1974. Below is a graph and table showing the observed mean maximum temperature for 2012, the normal maximum temperature for July and the record mean maximum temperature for July as well as the year the record was set and the last year it was at least this warm. Also, if 2012 was among the Top 20 warmest years on record, its ranking is shown in the table.

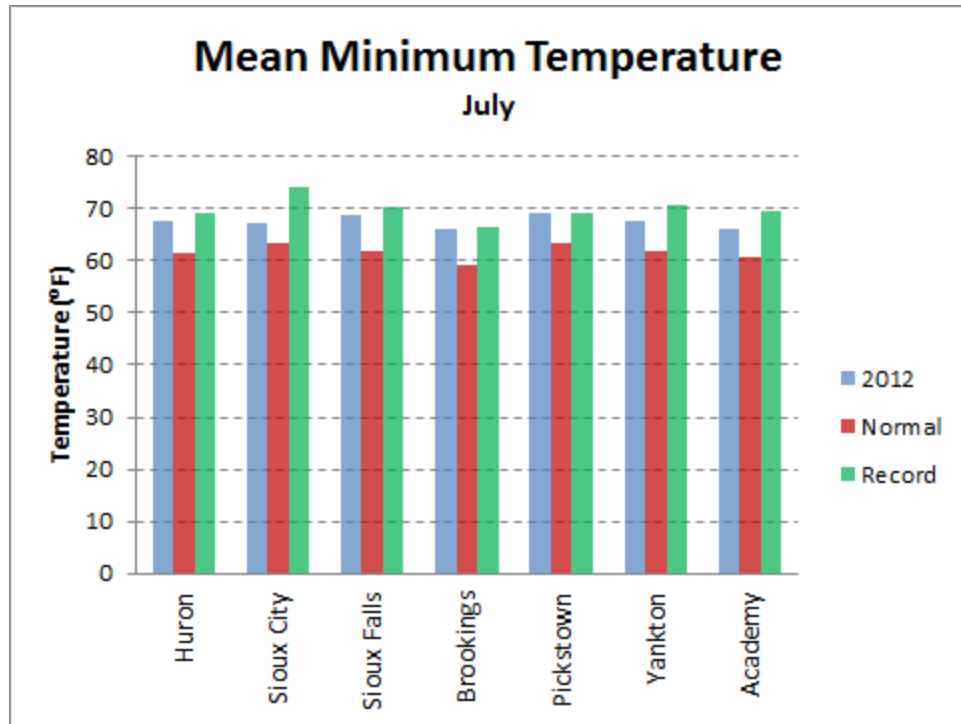
Location	2012	Normal	Departure from Normal	Rank	Record	Year of Record	Last Year so Warm
Huron	92.9	86.0	6.9	9	99.6	1936	2006
Sioux City	93.3	85.5	7.8	Tied 5	100.2	1936	1974
Sioux Falls	94.0	84.1	9.9	3	98.9	1936	1936
Brookings	88.4	81.6	6.8	14	97.6	1936	1957
Pickstown	100.0	87.9	12.1	1	95.4	2002	
Yankton	96.1	87.4	8.7	2	92.3	1933	1936
Academy	95.8	86.8	9.0	10	92.1	1956	1980



Minimum Temperature

Like the maximum temperature, the average minimum temperature for July was also above normal – ranging from 65 to 70. Except for Sioux City, this put July low temperatures as the Top 10 warmest on record. For Sioux Falls and Brookings it was the warmest July minimum temperatures since 1936. However, for the remaining sites, except Pickstown, last year's low temperatures in July were actually warmer. This is likely because the intensifying drought resulted in less moisture near the surface and allowed temperatures to cool more during the night. In 2011, the heat wave of mid to late July was accompanied by very high humidity and also warmer overnight lows.

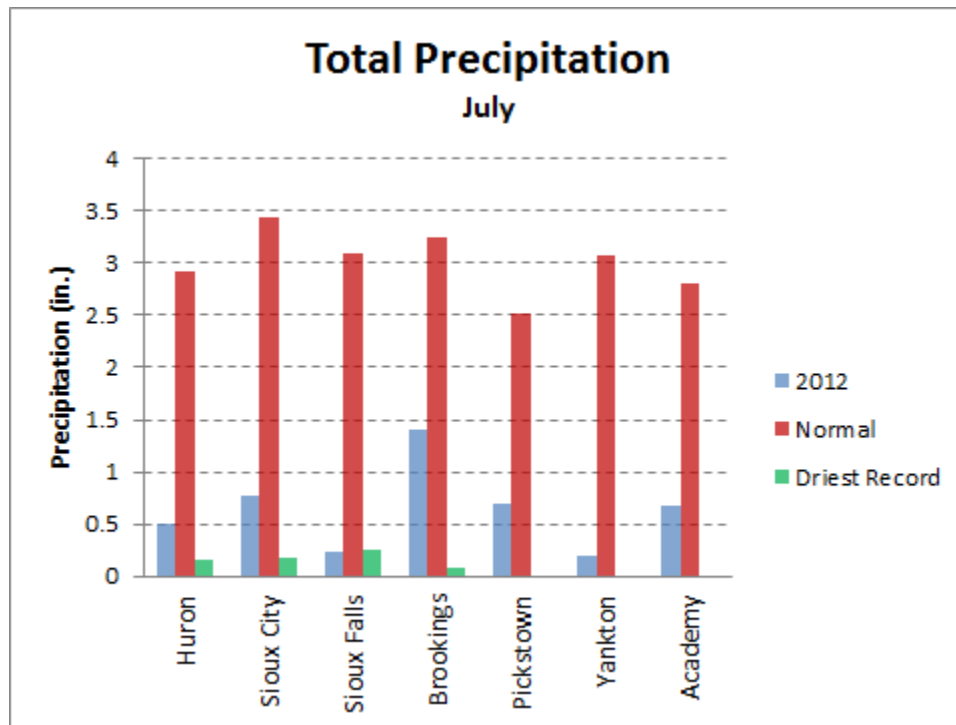
Location	2012	Normal	Departure from Normal	Rank	Record	Year of Record	Last Year so Warm
Huron	67.6	61.4	6.2	Tied 3	69.3	1936	2011
Sioux City	67.3	63.2	4.1	Tied 19	74.1	1936	2011
Sioux Falls	68.7	61.9	6.8	2	70.2	1936	1936
Brookings	66.2	59.1	7.1	3	66.5	1916	1936
Pickstown	69.3	63.2	6.1	1	69.0	1966	
Yankton	67.4	62.0	5.4	5	70.7	1936	2011
Academy	66.1	60.7	5.4	8	69.7	1936	2011



Precipitation

July was another dry month across the area as the drought intensified over the eastern plains. Only Brookings had over an inch of rain for the month and most of that fell on July 29 and it was also the only location that did not have one of its 10 driest Julys on record. For Sioux Falls it was the driest July on record, in Yankton it was the 2nd driest July on record, and Academy tied for the 9th driest July on record. For all 3 cities, the summer of 2012 has been the driest first two months of summer ever recorded. Interestingly, one does not have to go back too far to have experienced a July drier than 2012. Everywhere but Sioux Falls had a drier July in the last 5 years.

Location	2012	Normal	Departure from Normal	Rank	Driest Record	Year of Record	Last Year so Dry
Huron	0.50	2.92	-2.42	8	0.15	1932	2007
Sioux City	0.78	3.44	-2.66	Tied 9	0.18	1936	2011
Sioux Falls	0.24	3.09	-2.85	1	0.25	1947	
Brookings	1.40	3.25	-1.85		0.09	1894	2007
Pickstown	0.70	2.52	-1.82	7	0.00	2002	2007
Yankton	0.20	3.07	-2.87	2	0.00	2009	2009
Academy	0.67	2.80	-2.13	Tied 9	0.00	2009	2009



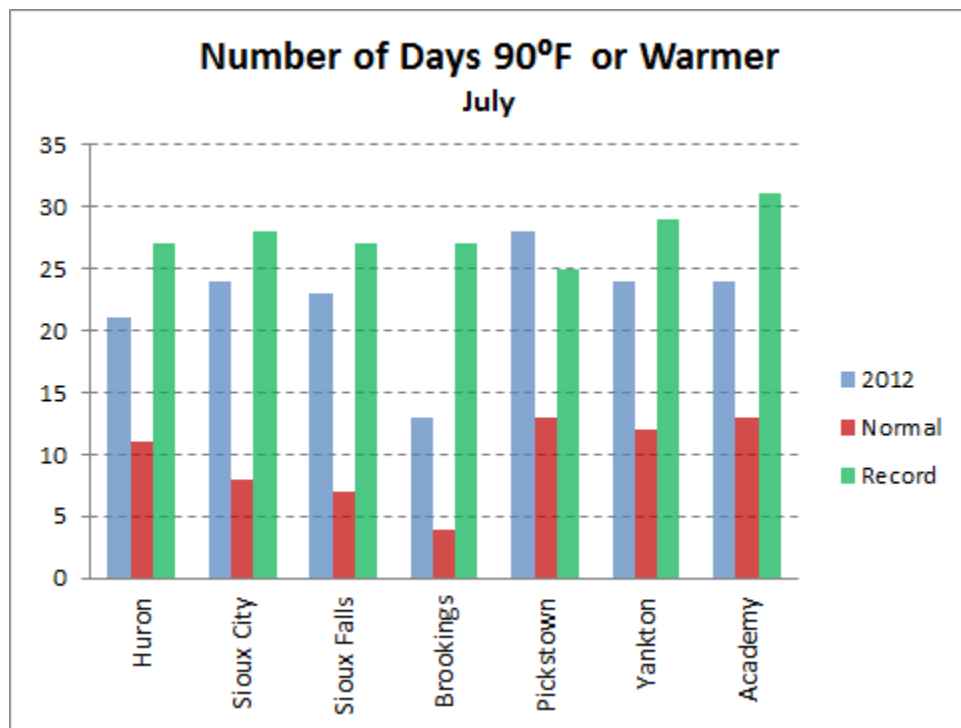
Days with extreme temperatures

One can also count the number of days with extreme temperatures as another way to judge how warm and uncomfortable the weather is. One measure is to examine how many days were at or above 90°F and above 100°F which results dangerous heat and a threat to life. Another measure is to examine how many days had minimum temperature at or above 70°F. Very warm nights can make it much more difficult to cool off residences during the evening and overnight.

While July did not have a record number of days above 90°F or 100°F, for many locations it was the most 90°F (100°F) days since the heat wave of 1974 and 1975. For Yankton, it was the most 100°F days since the 1936 heat wave. The only exception was in central South Dakota around Huron and Academy where drought conditions prevailed in 2006. The number of days with low temperatures at or above 70°F was above normal. While Huron, Brookings, Pickstown, and Sioux Falls had not seen so many warm nights in at least 50 years, the Sioux City and Yankton had lows in the 70s more often in 2011. As noted above, for these areas it was likely because drier conditions allowed nights to cool into the upper 60s more often.

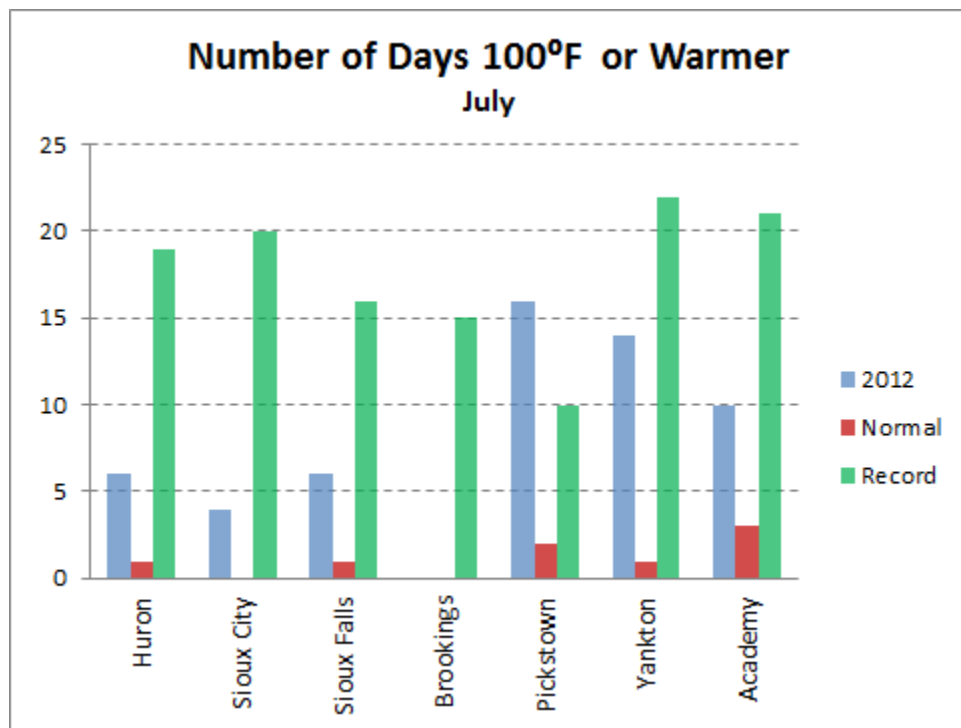
Number of days at or above 90 Degrees

Location	2012	Normal	Departure from Normal	Record	Year of Record	Last Year this Occurred
Huron	21	11	10	27	1936	2006
Sioux City	24	8	16	28	1936	1974
Sioux Falls	23	7	16	27	1936	1975
Brookings	13	4	9	27	1936	2002
Pickstown	28	13	15	25	1952, 1974	
Yankton	24	12	12	29	1936	1975
Academy	24	13	11	31	1935	1980



Number of days at or above 100 Degrees

Location	2012	Normal	Departure from Normal	Record	Year of Record	Last Year this Occurred
Huron	6	1	5	19	1936	2006
Sioux City	4	0	4	20	1936	1974
Sioux Falls	6	1	5	16	1936	1975
Brookings	0	0	0	15	1936	
Pickstown	16	2	14	10	2002	
Yankton	14	1	13	22	1936	1936
Academy	10	3	7	21	1936	2006



Number of days minimum temperature at or above 70 Degrees

Location	2012	Normal	Departure from Normal	Record	Year of Record	Last time observed
Huron	13	4	9	15	1936	1936
Sioux City	14	6	8	24	1936	2011
Sioux Falls	14	5	9	18	1936	1957
Brookings	11	2	9	13	1936	1936
Pickstown	16	5	11	15	1966	
Yankton	12	5	7	19	1936	1989
Academy	8	3	5	18	1936	2011

